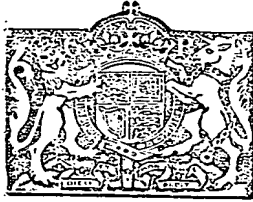


# PATENT SPECIFICATION



Application Date: Dec. 2, 1931. No. 33,395 / 31.

393,312

Complete Left: Sept. 1, 1932.

Complete Accepted: June 2, 1933.

## PROVISIONAL SPECIFICATION.

### Improvements in or relating to Pneumatic Tyre-casings.

We, THE INDIA RUBBER, GUTTA PERCHA AND TELEGRAPH WORKS COMPANY LIMITED, a British Company, of Aldwych House, Aldwych, London, W.C.2, and  
5 FREDERICK JOHN TARRIS, a British Subject, of The India Rubber, Gutta Percha and Telegraph Works Company Limited's Works, at Silvertown, London, E.16, do hereby declare the nature of this invention to be as follows:—

10 This invention consists in improvements in or relating to pneumatic tyre-casings and is directed to that type of casing wherein the textile foundation comprises  
15 a plurality of layers each containing one or more lengths of cord wound backwards and forwards across the casing and, during the formation, looped around transverse metallic pins or staples situated  
20 at the two edges of the casing.

Various proposals have been made for rendering the edges of the casing substantially inextensible and one design for this purpose has been described in prior  
25 Specification No. 320,535. The present invention is applicable to a tyre having a flexible metallic ring embedded in each lateral edge or bead of the tyre as described in the aforesaid prior Specification, but it is not limited to this construction as it may be applied to any construction embodying metal or other reinforcing strips or rings included for the purpose of rendering the lateral edges of  
35 the tyre substantially inextensible. All such rings will be referred to hereinafter as "lateral rings".

According to the present invention, a casing of the type referred to in the first  
40 paragraph of this Specification has each of its edges reinforced by one or more lateral rings and at each inner edge of the casing the cord loops of the layer or layers lying on the outside of the lateral ring or rings are laced to those of the layer or layers lying on the inside of that ring or those rings to enclose the said ring or rings between the layers.

In a preferred form of the invention,  
50 the lacing member extends backwards and forwards from side to side of the casing on the inside of the lateral ring or rings. The inside of such a ring will be that

side which is adjacent the axis of the casing.

In a preferred method of manufacturing the tyre, the cords of the several layers are, in a known manner, laid across an annular former of the usual toric shape and, at what will be the inner edges of the casing, they are looped round laterally projecting pins or the like which serve to hold the cord loops in position during the formation of the casing. The cords are laid from side to side of the former obliquely with respect to a circumferential line thereof, and the lay of the cords in an outer layer crosses in an opposite direction the lay of the cords in an inner layer. The lateral rings, with filling pieces where necessary, are placed in position on the former after the first ply of cords has been laid. The cord may be flattened to have a major and minor axis and each length of cord, as it extends across the former, may be twisted so that it lies with the major axis parallel to the surface of the former at the central circumferential line thereof, but with the said axis at right angles to the surface where the cord passes around the pins located in the skirts of the former.

After the casing has been built up it is removed from the former, the side edges of the casing being lifted away from the pins. At each edge of the tyre the cord loops lying on opposite sides of the lateral reinforcing ring or rings are now laced together by a lacing that passes on the inner side of the ring or rings and zigzags backwards and forwards from one side of the edge of the casing to the other side of that edge.

The tyre-casing in other respects is formed and completed in a manner well understood in this industry, and it will be appreciated that the foundation may comprise more than two layers of cord, in which case more than one lacing may be necessary at each edge of the casing. For instance, a lateral ring may be inserted between each pair of adjacent layers, in which case the cord loops on each side of each ring would be laced together.

Dated this 2nd day of December, 1931.

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BOULT, WADE &amp; TENNANT,

111 & 112, Hatton Garden, London,  
E.C.1.  
Chartered Patent Agents.

## COMPLETE SPECIFICATION.

## Improvements in or relating to Pneumatic Tyre-casings.

We, THE INDIA RUBBER, GUTTA PERCHA AND TELEGRAPH WORKS COMPANY LIMITED, a British Company, of Aldwych House, Aldwych, London, W.C.2, and  
 5 FREDERICK JOHN TARRIS, a British Subject, of The India Rubber, Gutta Percha and Telegraph Works Company Limited's Works, at Silvertown, London, E.16, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention consists in improvements  
 15 in or relating to pneumatic tyre-casings and is directed to that type of casing (referred to hereinafter as "a casing of the type described") wherein the textile reinforcement comprises a plurality of layers each containing one or more lengths of cord wound backwards and forwards across the casing and, during the formation, looped around transverse pins or staples situated at the two edges of the casing.

Various proposals have been made for rendering the edges of the casing substantially inextensible and one design for this purpose has been described in prior  
 30 Specification No. 320,535. The present invention is applicable to a tyre having a flexible metallic ring embedded in each lateral edge or head of the tyre as described in the aforesaid prior Specification, but it is not limited to this construction as it may be applied to any construction embodying metal or other reinforcing strips or rings included for the purpose of rendering the lateral edges of the tyre substantially inextensible. All  
 40 such rings will be referred to hereinafter as "lateral rings".

According to the present invention, a casing of the type described has each of  
 45 its edges reinforced by one or more lateral rings and at each inner edge of the casing the cord loops of the layer or layers lying on the outside of the lateral ring or rings are laced to those of the layer or layers  
 50 lying on the inside of that ring or those rings to enclose the said ring or rings between the layers.

In a preferred form of the invention, the lacing member extends backwards and  
 55 forwards from the outside to the inside of

the edge of the casing on the inside of the lateral ring or rings. The inside of such a ring will be that side which is adjacent the axis of the casing.

In order that the invention may be more clearly understood, a preferred example will now be described with the aid of the accompanying drawings in which:—

Figure 1 is a view looking outwardly from the axis of the tyre on one edge of the cord loop showing the lacing in position.

Figure 2 is a section on the line 2—2 of Figure 1, simplified to show a loop in the plane of the paper, and

Figure 3 is a partial side view of the lacing looking downwardly in Figure 1.

Like reference numerals indicate like parts throughout the several figures of the drawings.

In accordance with known practice, the cords 10 of the several layers, (the casing shown in the drawings has two layers) are in known manner laid across an annular former of the usual toric shape. The former and other parts utilised in arranging the cord loop of the layer or of the several layers are not illustrated in the accompanying drawings; but it will be readily understood that after the cord loops have been laid across the former they will be looped round laterally projecting pins or the like, at what will be the inner edges of the casing, and these projecting pins or the like serve to hold the cord loop in position during the formation of the casing. The cords are as indicated in the drawings laid from side to side of the former obliquely with respect to a circumferential line thereof, and the lay of the cords in an outer layer will cross in an opposite direction the lay of the cords in an inner layer. The lateral rings with filling pieces where necessary, are placed in position on the former after the first ply of cords has been laid. One such ring is shown as composed of stranded wires 11. The cord may be flattened to have a major and minor axis and each length of cord, as it extends across the former, may be twisted so that it lies with the major axis parallel to the surface of the former at the central circumferential line thereof, but with the said axis at right angles to

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the surface where the cord passes around the pins located in the skirts of the former.

After the casing has been built up it is removed from the former, the side edges of the casing being lifted away from the pins. All of the above procedure is in accordance with known practice.

In accordance with the present invention, at each edge of the tyre, the cord loops lying on opposite sides of the lateral reinforcing ring 11, are now laced together by a lacing 12 that passes on the inner side of the ring 11 and zigzags backwards and forwards from one side of the edge of the casing to the other side of that edge.

The tyre-casing in other respects is formed and completed in a manner well understood in this industry, and it will be appreciated that the foundation may comprise more than two layers of cord, in which case more than one lacing may be necessary at each edge of the casing. For instance, a lateral ring may be inserted between each pair of adjacent layers, in which case the cord loops on each side of each ring will be laced together.

The casing may be built up in other ways than on a former of toric form. For example it may be built up upon a cylindrical form having a transversely flat sur-

face, radial pins being provided in the edges of the drum to receive the cord loops.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A casing of the type described having each of its edges reinforced by one or more lateral rings, and at each inner edge of the casing the cord loops of the layer or layers lying on the outside of the lateral ring or rings, are laced to those of the layer or layers lying on the inside of that ring or rings to include the said ring or rings between the layers.

2. A tyre-casing according to Claim 1 in which the lacing member extends backwards and forwards from the outside to the inside of the edge of the casing on the inside of the lateral ring or rings.

3. A tyre-casing having its edges reinforced by a ring or rings, and having a cord loop laced substantially as described herein or substantially as shown in the accompanying drawings.

Dated this 1st day of September, 1932.

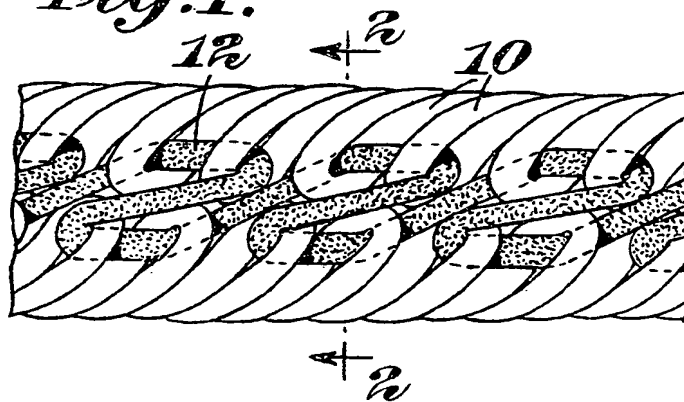
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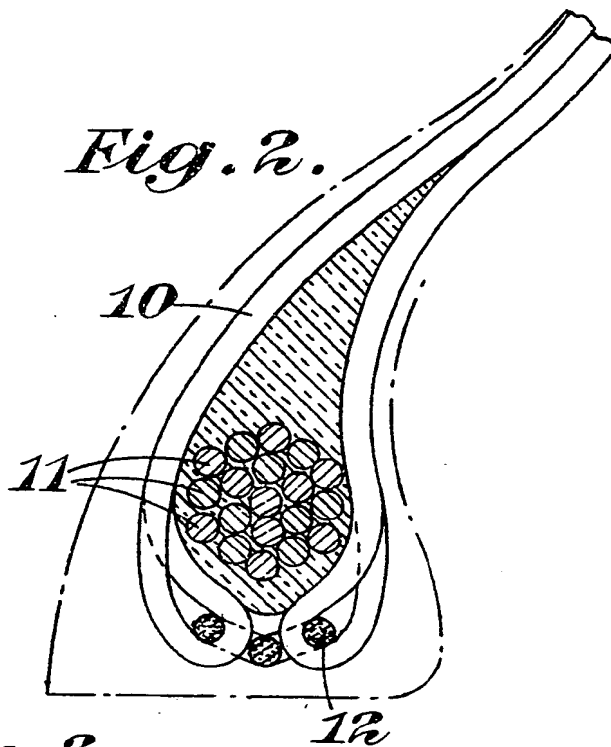
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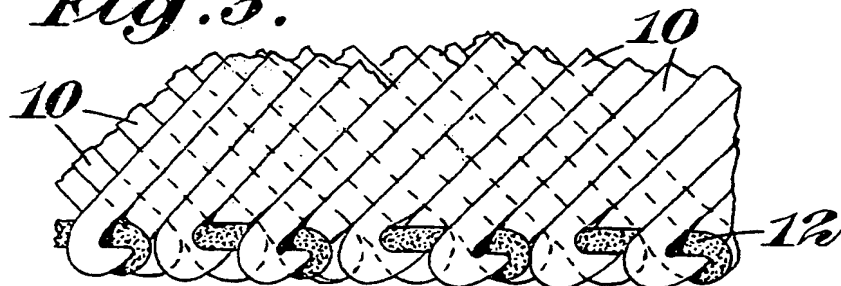
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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[This Drawing is a reproduction of the Original on a reduced scale.]